

COORDINATING MANUFACTURING BY LOCAL AND REMOTE MANUFACTURERS FOR
A PERSONALIZED DESIGN IN AN ELECTRONIC COMMERCE SYSTEM

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CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is related to the following copending applications, which are incorporated herein by reference:

(1) U.S. Patent Application Serial No. ____/____ (Attorney Docket No. AUS920010356US1); and

(2) U.S. Patent Application Serial No. ____/____ (Attorney Docket No. AUS920010357US1).

BACKGROUND OF THE INVENTION

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1. Technical Field:

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The present invention relates in general to electronic commerce and, in particular, to facilitating personalized designs where utilizing both remote and local manufacturers may be advantageous. Still more particularly, the present invention relates to brokering a personalized design among remote and local manufacturers such that a customer obtains a locally assembled, cost effective product.

2. Description of the Related Art:

In recent years, with the development of computer network technology, an electronic commerce (e-commerce) system has developed in which consumers and vendors are connected via a network. Electronic commerce can occur between a consumer and a vendor through, for example, an online information service, the Internet, a bulletin board system (BBS) or electronic data interchange (EDI).

There are many different methods in which e-commerce may be implemented as there are a vast variety of commodities and services in need of being traded. Many e-commerce systems operate on a post and match process; that is, the systems work by having a prospective consumer bid on an item and if the bid matches the vendor's specified selling price, the item is sold to that consumer. In another example, many e-commerce systems involve on-line auctions where vendors place products or services up for bid and consumers electronically place bids for purchasing the products or services; the item is sold to the consumer with the highest bid.

Other e-commerce systems allow users to view a graphical rendering of products as the user selects from multiple options that change the appearance of the product utilizing software tools such as Shockwave™. For example, a graphical rendering of a shirt may be provided where the color of the shirt in the graphical rendering changes according to a color selected by the user.

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The present e-commerce systems are limited in that some products are more advantageous to receive from a local manufacturer, however the user is typically ordering a product from a remote manufacturer, where the remote manufacturer ships the product via mail service. Moreover, where a user can order a product that is available for local delivery, the user is not provided with multiple bids for the product including local and remote manufacturer bids for the product. For example, where a user is purchasing a piece of jewelry or a perishable good, assembly of the jewelry or perishable good by a local jeweler or bakery may be preferable to receiving the piece of jewelry or perishable good via shipment.

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Therefore, in view of the foregoing, it would be advantageous to provide a method, system and program for facilitating the personalized design of products where utilization of both local and remote manufacturers is advantageous.

SUMMARY OF THE INVENTION

In view of the foregoing, it is therefore an object of the present invention to provide an improved method, system and program for performing electronic commerce.

It is another object of the present invention to provide a method, system and program for facilitating personalized designs where utilizing both remote and local manufacturers may be advantageous.

It is yet another object of the present invention to provide a method, system and program for brokering a personalized design among remote and local manufacturers such that a customer obtains a locally assembled, cost effective product.

According to one aspect of the present invention, a manufacturing order from a user is divided into multiple manufacturable parts. Next, a local bid request for the manufacturing order is submitted to multiple local manufacturers.

In response to receiving multiple local bids for the manufacturing order, a remote bid request is submitted to multiple remote manufacturers for bidding on a selection of the manufacturable parts as requested in the local bids. The user is then enabled to select from the bid options provided by local and remote manufacturers.

All objects, features, and advantages of the present invention will become apparent in the following detailed written description.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself however, as well as a preferred mode of use, further objects and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts one embodiment of a computer system with which the method, system and program of the present invention may advantageously be utilized;

Figure 2 illustrates a simplified block diagram of a client/server environment in which electronic commerce typically takes place in accordance with the method, system and program of the present invention;

Figure 3 depicts a block diagram of a preferred client/server environment for facilitating a personalized design and then procuring local and remote manufacturers for the personalized design according to the method, system and program of the present invention;

Figure 4 illustrates a block diagram of one embodiment of a broker server system in accordance with the method, system and program of the present invention;

Figure 5A-5B depicts a high level logic flowchart of the process and program for facilitating and brokering personalized designs according to the method, system and program of the present invention;

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Figure 6 depicts a high level logic flowchart of a process and program for personalizing a design and placing an order for that personalized design according to the method, system and program of the present invention;

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Figure 7 depicts a high level logic flowchart of a process and program for controlling a local manufacturer system in accordance with the present invention;

Figure 8 illustrates a block diagram of a data storage structure for products in accordance with the method, system and program of the present invention;

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Figure 9 depicts a block diagram of a data storage structure for local manufacturer registration information in accordance with the method, system and program of the present invention;

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Figure 10 illustrates a block diagram of a data storage structure for remote manufacturer registration information in accordance with the method, system and program of the present invention;

5 **Figure 11** depicts a block diagram of a data storage structure for user registration information in accordance with the method, system and program of the present invention;

5 **Figure 12** illustrates a block diagram of a data storage structure for tracking personalized designs in accordance with the method, system and program of the present invention;

5 **Figure 13** depicts a block diagram of a data storage structure for storing attribute and variable selections for a personalized design in accordance with the method, system and program of the present invention;

5 **Figure 14** illustrates a block diagram of a data storage structure for storing local manufacturer bids in accordance with the method, system and program of the present invention; and

20 **Figure 15** depicts a block diagram of a data storage structure for storing remote manufacturer bids in accordance with the method, system and program of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A method, system and program for facilitating user entry of personalized designs and procuring local and remote manufacturers for manufacturing portions of a personalized design order are provided, such that a local manufacturer can manufacture and assemble the personalized design order utilizing portions manufactured by the remote manufacturers. In the present invention, "user" preferably refers to the individual, group, organization, business or corporation submitting an order for a personalized design. "Personalized designs" preferably include both personalized products and services. "Personalized design order" preferably refers to requests for manufacture of both personalized products and services. "Remote manufacturer" preferably refers to the individual, group, organization, business, or corporation that will bid on a manufacturable portion of a personalized design order and then manufacture the manufacturable portion if selected, however the remote manufacturer may or may not actually be geographically remote to the buyer. "Local manufacturer" preferably refers to the individual, group, organization, business, or corporation that will assemble and manufacture portions of the personalized design order, however the local manufacturer may or may not actually be geographically local to the buyer.

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In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be apparent, however, to one skilled in the art that the

present invention may be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to avoid unnecessarily obscuring the present invention.

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HARDWARE OVERVIEW

The present invention may be executed in a variety of systems, including a variety of computing systems and electronic devices under a number of different operating systems. In one embodiment of the present invention, the computer system is a portable computing system such as a notebook computer, a palmtop computer, a personal digital assistant, a telephone or other electronic computing system that may also incorporate communications features that provide for telephony, enhanced telephony, messaging and information services. However, the computer system may also be, for example, a desktop computer, a network computer, a midrange computer, a server system or a mainframe computer. Therefore, in general, the present invention is preferably executed in a computer system that performs computing tasks such as manipulating data in storage that is accessible to the computer system. In addition, the computer system preferably includes at least one output device and at least one input device.

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Referring now to the drawings and in particular to **Figure 1**, there is depicted one embodiment of a computer system with which the method, system and program of the present invention may advantageously be utilized. Computer system **10** comprises a bus

22 or other communication device for communicating information within computer system 10, and at least one processing device such as processor 12, coupled to bus 22 for processing information. Bus 22 preferably includes low-latency and high-latency paths that are connected by bridges and controlled within computer system 10 by multiple bus controllers.

Processor 12 may be a general-purpose processor such as IBM's PowerPC™ processor that, during normal operation, processes data under the control of operating system and application software stored in a dynamic storage device such as random access memory (RAM) 14 and a static storage device such as Read Only Memory (ROM) 16. The operating system preferably provides a graphical user interface (GUI) to the user. In a preferred embodiment, application software contains machine executable instructions that when executed on processor 12 carry out the operations depicted in the flowcharts of FIGS. 5, 6, 7, 8, and others described herein. Alternatively, the steps of the present invention might be performed by specific hardware components that contain hardwire logic for performing the steps, or by any combination of programmed computer components and custom hardware components.

The present invention may be provided as a computer program product, included on a machine-readable medium having stored thereon the machine executable instructions used to program computer system 10 to perform a process according to the present invention. The term "machine-readable medium" as used herein

includes any medium that participates in providing instructions to processor 12 or other components of computer system 10 for execution. Such a medium may take many forms including, but not limited to, non-volatile media, volatile media, and transmission media. Common forms of non-volatile media include, for example, a floppy disk, a flexible disk, a hard disk, magnetic tape or any other magnetic medium, a compact disc ROM (CD-ROM), a digital video disc-ROM (DVD-ROM) or any other optical medium, punch cards or any other physical medium with patterns of holes, a programmable ROM (PROM), an erasable PROM (EPROM), electrically EPROM (EEPROM), a flash memory, any other memory chip or cartridge, or any other medium from which computer system 10 can read and which is suitable for storing instructions. In the present embodiment, an example of non-volatile media is storage device 18. Volatile media includes dynamic memory such as RAM 14. Transmission media includes coaxial cables, copper wire or fiber optics, including the wires that comprise bus 22. Transmission media can also take the form of acoustic or light waves, such as those generated during radio wave or infrared data communications.

Moreover, the present invention may be downloaded as a computer program product, wherein the program instructions may be transferred from a remote computer such as a server 39 to requesting computer system 10 (e.g., a client) by way of data signals embodied in a carrier wave or other propagation medium via a network link 34 (e.g., a modem or network connection) to a communications interface 32 coupled to bus 22. Communications

interface **32** provides a two-way data communications coupling to network link **34** that may be connected, for example, to a local area network (LAN), wide area network (WAN), or as depicted herein, directly to an Internet Service Provider (ISP) **37**. In particular, network link **34** may provide wired and/or wireless network communications to one or more networks.

ISP **37** in turn provides data communication services through the Internet **38** or other network. Internet **38** may refer to the worldwide collection of networks and gateways that use a particular protocol, such as Transmission Control Protocol (TCP) and Internet Protocol (IP), to communicate with one another. ISP **37** and Internet **38** both use electrical, electromagnetic, or optical signals that carry digital data streams. The signals through the various networks and the signals on network link **34** and through communication interface **32**, which carry the digital data to and from computer system **10**, are exemplary forms of carrier waves transporting the information.

Further, multiple peripheral components may be added to computer system **10**. For example, an audio output **28** is attached to bus **22** for controlling audio output through a speaker or other audio projection device. A display **24** is also attached to bus **22** for providing visual, tactile or other graphical representation formats. A keyboard **26** and cursor control device **30**, such as a mouse, trackball, or cursor direction keys, are coupled to bus **22** as interfaces for user inputs to computer system **10**. In alternate embodiments of the present invention, additional input

and output peripheral components may be added.

With reference now to **Figure 2**, there is depicted a simplified block diagram of a client/server environment in which electronic commerce typically takes place in accordance with the method, system and program of the present invention. The client/server environment may be implemented within multiple network architectures. For example, the architecture of the World Wide Web (the Web) follows a traditional client/server modeled environment.

The terms "client" and "server" are used to refer to a computer's general role as a requester of data (the client) or provider of data (the server). In the Web environment, web browsers such as Netscape Navigator™ typically reside on clients **40a-40n** and render Web documents (pages) served by servers **42a-42n**. Additionally, each of clients **40a-40n** and servers **42a-42n** may function as both a "client" and a "server" and may be implemented utilizing a computer system such as computer system **10** of **Figure 1**.

The Web may refer to the total set of interlinked hypertext documents residing on servers all around the world. A network **44**, such as the Internet, provides an infrastructure for transmitting these hypertext documents between clients **40a-40n** and servers **42a-42n**. Documents (pages) on the Web may be written in multiple languages, such as Hypertext Markup Language (HTML) or Extensible Markup Language (XML), and identified by Uniform

Resource Indicators (URIs) that specify the particular server **42a-42n** and pathname by which a file can be accessed, and then transmitted from server **42a-42n** to an end user utilizing a protocol such as Hypertext Transfer Protocol (HTTP). Web pages 5 may further include text, graphic images, movie files, and sounds as well as Java applets and other small embedded software programs that execute when the user activates them by clicking on a link.

DESIGN FACILITATION AND MANUFACTURER PROCUREMENT OVERVIEW

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Referring now to **Figure 3**, there is depicted a block diagram of a preferred client/server environment for facilitating a personalized design and then procuring local and remote manufacturers for the personalized design according to the method, system and program of the present invention. As illustrated, a client system **50** is connected to network **44**. Client system **50** represents one of multiple client systems from which buyers may request access to a broker server **54** via network **44**. Broker server **54** represents at least one server system which facilitates personalized designs via client system **50** and then communicates with multiple remote manufacturer systems **56a-56n** and multiple local manufacturer systems **52a-52n** via network **44**. In addition, remote manufacturer systems **56a-56n** and local manufacturer systems **52a-52n** may further communicate with each other via network **44** in order to coordinate manufacturing. In an alternate embodiment, broker server **54** may be incorporated into client system **50**, local manufacturer systems **52a-52n** or remote

manufacturer systems **56a-56n**.

A user preferably utilizes client system **50** to request access to broker server **54**. Broker server **54** then interacts with client system **50** to facilitate the user in personalizing a design. Broker server **54** preferably registers multiple local manufacturer systems **52a-52n** and remote manufacturer systems **56a-56n** according to categories of products available from each of the local and remote manufacturers. Broker server **54** may then facilitate personalized designs within the constraints of products offered by local and remote manufacturers.

In one embodiment of the present invention, the personalized design is for a product where local assembly is advantageous, however may require parts to be manufactured by remote manufacturers and provided to the local manufacturer for assembly. For example, a wedding cake may be a personalized design facilitated by broker server **54**. Portions of the wedding cake design such as figurines or special sized cake pans to bake the cakes need to be provided by a remote manufacturer to a local baker who then bakes and assembles the wedding cake. In another example, it is preferable to utilize a local jeweler to assemble a ring, however the personalized design facilitated by broker server **54** may require a remote manufacturer to produce the band for the ring or cut the stone for the ring.

Users may advantageously provide customized specifications to broker server **54** via client system **50** or other media

transmission method. Broker server 54 may then facilitate personalized designs offering the customized specifications provided by the user and further facilitate obtaining a manufacturer for the customized specifications. In particular, broker server 54 may first solicit bids for the personalized design from local manufacturers. Then, depending on manufacturable parts needed by the local manufacturers placing bids, broker server 54 may solicit bids from remote manufacturers.

With reference now to **Figure 4**, there is depicted a block diagram of one embodiment of a broker server system in accordance with the method, system and program of the present invention. As illustrated, broker server **54** includes multiple databases including, but not limited to user profiles **60**, manufacturer profiles **61**, products **62**, personalized products **64**, bids **65** and product orders **66**. In addition, broker server **54** may include multiple software applications such as specializing application **68** and rendering application **70**.

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Advantageously, user profiles **60** and manufacturer profiles **61** include, but are not limited to, registration information for users, local manufacturers, and remote manufacturers. User profiles **60** preferably includes, but is not limited to, a user identification, financial information, shipping information, personal information, design history, purchase history, ratings by local and remote manufacturers and customized specifications according to user. Manufacturer profiles **61** preferably includes,

but are not limited to, a manufacturer identification, payment requirements, shipping information, delivery information, manufacturing history and ratings by users and other manufacturers.

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Products 62 preferably includes, but is not limited to, a database of current product offerings as compiled from available local and remote manufacturers. Product offerings are preferably referenced by a product identification and the database further references attributes and variables available for each product offering, as will be further described.

Personalized products **64** preferably includes a database of selections by user when personalizing a product. A user may enter a product name to be associated with the personalized design and then order the personalized design or save the personalized design for future changes or ordering. Broker server **64** may utilize the information in personalized products **64** to monitor user preferences and other qualifiable information.

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As a user is selecting a product, attributes and variables, rendering application **70** preferably renders a graphical representation of the personalized design that is then made available to the user. The rendered graphical representation is also transmitted to local and remote manufacturers with bid requests in order to show the product expected by the user. In particular, the graphical rendering may be stored at a particular location within broker server **54**.

Once a user places an order, specializing application **68** preferably divides a personalized design into multiple manufacturable parts, submits bid requests to multiple local manufacturers and monitors the status of the order in product orders database **66**. Local manufacturers in return provide bids on the personalized design which are stored in bids database **65**. Bids by local manufacturers also indicate which of the multiple manufacturable parts the local manufacturer will need in order to manufacture and/or assemble the personalized design. In addition, the local manufacturer may indicate additional manufacturable parts or supplies which will be required to manufacture and/or assemble the personalized design.

Specializing application **64** preferably distributes additional bid requests to remote manufacturers for the manufacturable parts and any additional supplies required by local manufacturers who place bids. Bids that are received from the remote manufacturers are also stored in bids database **65**. Specializing application **68** then provides a list of available manufacturers to the user for selection.

The selection of available manufacturers made by the user is further stored in product orders **66** and order requests are sent for the manufacturable parts to the selection of available manufacturers. In addition, specializing application **68** facilitates financial settlement between the user and the selected manufacturers.

Referring now to **Figure 5A-5B**, there is depicted a high level logic flowchart of the process and program for facilitating and brokering personalized designs according to the method, system and program of the present invention. As illustrated, the process starts at block **120** and thereafter proceeds to block **122**. Block **122** depicts the determination of what event occurred when an event occurs. If a design request is received, then the process passes to block **124**. If an order request is received, then the process passes to block **156**.

In response to receiving a design request, block 124 depicts transmitting a selection of available products including the customized products according to user. As previously described, a user may provide customized product specifications that are formatted by the broker server for selection by the user during the personalized design process.

Next, block 126 illustrates a determination as to whether or not a selection by the user from among the products is received. If a product selection is not received, then the process passes to block 146. If a product selection is received, then the process passes to block 128.

Block **128** depicts rendering a generic graphical representation of the personalized design according to the product selection. Next, block **130** illustrates calculating an estimate for the personalized design according to the current selections and the process passes to block **132**. The estimate may

include cost, manufacturing time, delivery time, structural feasibility and other analysis as the user makes selections. The estimate may be provided to the user during the design process, at the conclusion of the design process, or hidden from the user.

5 In addition, the estimate may be transmitted to the manufacturers with bid requests to provide a range of estimates preferred by the user and/or anticipated by the broker server. In addition, although not depicted, during the design process a user may select to receive advice or help, or alternatively advice or help may automatically be provided to aid the user in making selections.

Block 132 illustrates transmitting available attributes according to the product selection and customized attributes according to the user and the process passes to block 134. A user may provide customized attribute specifications that are formatted by the broker server and provided to the user during the design process.

20 Block 134 depicts a determination as to whether or not a selection from among the available attributes is received. If an attribute selection is not received, then the process passes to block 146. If an attribute selection is received, then the process passes to block 136.

25 Block 136 illustrates transmitting the available variables according to attribute selection and customized variables according to user and the process passes to block 138. A user

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may provide customized variable specifications that are formatted by the broker server and provided to the user during the design process. For example, a user may provide a photograph as a variable to be selected from among multiple graphical image variables.

Block **138** depicts a determination as to whether or not a selection by the user from among the variables is received. If a selection is not received, then the process passes to block **134**. Otherwise, if a selection is received, then the process passes to block **140**. Block **140** illustrates calculating an estimate, as previously described. Next, block **142** depicts rendering a representation of the personalized design according to the current selections and the process passes to block **138**.

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When no further selections have been made by the user, block 146 illustrates a determination as to whether the user indicates the design is completed. If the user does not indicate the design is completed, then the process passes to block 126. If the user indicates the design is completed, then the process passes to block 148.

Block 148 depicts storing the selections for the user according to a product name or other identification as provided by the user or assigned by the broker server. Next, block 150 illustrates analyzing the design integrity. In analyzing the integrity of a personalized design, multiple integrity qualifications may be analyzed including, but not limited to,

chemical integrity, structural integrity, electrical integrity, and financial integrity. Thereafter, block 152 depicts a determination as to whether or not the design has integrity. If the design integrity is not questionable, then the process ends. If the design integrity is questionable, then the process passes to block 154. Block 154 illustrates suggesting adjustments to the current design and the process ends.

In response to receiving an order request, block 156 depicts apportioning a design order request into multiple manufacturable parts according to type of manufacture or other suitable criteria. Next, block 158 illustrates distributing the apportioned design order request to pertinent local manufacturers. Preferably a deadline is provided for returning bids on the design request. Thereafter, block 160 depicts a determination as to whether or not bids are received. If bids from local manufacturers are not received the process iterates at block 160 for a particular period of time. If bids from local manufacturers are received, then the process passes to block 162.

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Block 162 depicts determining which parts are needed from remote manufacturers. In particular, local manufacturers will return bids based on the parts to be assembled and manufactured by the local manufacturer and indicate parts to be manufactured by remote manufacturers. Next, block 164 illustrates distributing bid requests for the needed parts to multiple remote manufacturers according to type of manufacture or other criteria. In addition, the needed parts bid requests may be sent to other

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local manufacturers who are able to manufacture needed parts. Preferably, a deadline for submitting bids is set with the needed parts bid requests. Thereafter, block 166 depicts a determination as to whether or not bids are received from the remote manufacturers. If bids have not been received, then the process iterates at block 160 for a particular period of time. If bids have been received, then the process passes to block 168.

Block 168 illustrates compiling the local and remote bids. In compiling the bids, multiple cost and delivery options are determined. Next, block 170 depicts presenting the cost and delivery options to the user based on the compiled local and remote bids. Preferably a deadline for selecting manufacturers is provided with the cost and delivery options. Thereafter, block 172 illustrates a determination as to whether or not the user has selected manufacturers from among the bids. If a user has not selected manufacturers from among the bids, then the process iterates at block 172 for a particular amount of time. If a user has selected from among the bids, then the process passes to block 174. Alternatively, the local manufacturer may first be given an opportunity to select from the bids by remote manufacturers such that the user is shown bids from local manufacturers with the cost and delivery adjustments already made according to remote manufacturer selection.

Block 174 depicts settling a financial transaction with the user for the design order. Next, block 176 illustrates placing an order for the design with the selected manufacturers and

completing the financial transaction with those manufacturers and the process ends.

USER DESIGN PERSONALIZING CONTEXT

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With reference now to **Figure 6**, there is illustrated a high level logic flowchart of a process and program for personalizing a design and placing an order for that personalized design according to the method, system and program of the present invention. As depicted, the process starts at block **80** and thereafter proceeds to block **82**. Block **82** illustrates a determination as to what type of event occurred when an event occurs. If a request to design is received, then the process passes to block **84**. Alternatively, if a request to order is received, then the process passes to block **92**.

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Block **84** depicts transmitting a request for a design page from a broker server according to the user identification. Next, block **86** illustrates a determination as to whether or not access to a design page is received. If access is not received, then the process iterates at block **86** and may also exit the process if an error is detected. If access is received, then the process passes to block **87**.

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Block **87** illustrates a determination as to what event occurred when an event occurs. If the user makes a selection, then the process passes to block **88**. If the user is finished making selections, then the process passes to block **91**.

Block 88 depicts transmitting the product, attribute, or variable selections to the broker server as selected. Next, block 90 illustrates displaying the rendered graphical product representation received from the broker server and the process passes to block 87.

When the user is finished making selections, block 91 illustrates transmitting a request to save the selections according to a product name or other identifier and the process ends.

Upon receiving a user request to order a personalized design, block 92 depicts transmitting a personalized design order request according to a product name or other identifier. Next, block 94 illustrates a determination as to whether or not cumulative bids are received from the broker server. If cumulative bids are not received from the broker server, then the process iterates at block 94 for a particular time period. If cumulative bids are received from the broker server, then the process passes to block 96. Block 96 depicts transmitting any selections of manufacturers made by the user from the bid options. Next, block 98 illustrates approving a financial transaction for payment for the personalized design and the process ends.

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LOCAL MANUFACTURER CONTEXT

Referring now to **Figure 7**, there is illustrated a high level

logic flowchart of a process and program for controlling a local manufacturer system in accordance with the present invention. As depicted, the process starts at block 180 and thereafter proceeds to block 182. Block 182 illustrates a determination as to what type of event occurred when an event occurs. If a list of remote manufacturers is received, then the process passes to block 183. If a local bid request is received, then the process passes to block 186. Otherwise, a product order is received, then the process passes to block 192.

Block 183 depicts filtering the list of remote manufacturers according to preferences. Preferences may include a list of preferred manufacturers, types of preferred manufacturers, preferred locations for remote manufacturers, preferred pricing and other criteria that may be utilized to narrow the list of remote manufacturers. Next, block 184 illustrates transmitting a selection from among the remote manufacturers to the broker server and the process ends.

Block 186 illustrates filtering the local bid request according to manufacturing abilities of the local manufacturer. Next, block 188 depicts compiling a bid offer including a cost, delivery estimate, and selection of manufacturable parts to be received from a remote manufacturer. Thereafter, block 190 illustrates transmitting the bid offer to the broker server and the process ends.

Block 192 depicts processing the product order and the

process ends. Processing the product order may include financial settlement, setting production deadlines, ordering parts and other steps including in manufacturing a product order.

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DATA STORAGE CONTEXT

With reference now to **Figure 8**, there is depicted a block diagram of a data storage structure for products in accordance with the method, system and program of the present invention. As illustrated, the data corresponding to available products is preferably stored in a data storage structure such as database table **200**. The example database table **200** is provided in order to depict a selection of fields **202** which may be included in a data storage structure. Fields **202** include, but are not limited to, a product, attribute, variables, cost estimates and design advice. In alternate embodiments, alternate types of data storage structures and methods may be utilized.

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In the example, the product "cake" has five attributes that may be personalized including, but not limited to, a number of cakes, figurines, flavors, cake shapes and cake sizes. Each attribute then has variables that may be selected from to further personalize a design. For example, a number of cakes in the range of one to thirty may be selected.

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Advantageously, the product, attribute and variable selections are compiled from the products, attributes and variables provided by the registered manufacturers.

Alternatively, a broker server may add product, attribute and

variable selections as users indicate a preference for such.

Further, cost estimates and design advice may be provided as requested or as needed. In particular, design advice may include textual messages, graphical representations, demonstrations, wizard applications and other automated forms of aiding a user in personalizing a design. In addition, a user may directly contact a broker employee who aids the user in personalizing a design via a video display, textual display, voice output or other electronic communication tool.

Referring now to **Figure 9**, there is depicted a block diagram of a data storage structure for local manufacturer registration information in accordance with the method, system and program of the present invention. As illustrated, the data corresponding to local manufacturer registration information is preferably stored in a data storage structure such as database table **205**. The example database table **205** is provided in order to depict a selection of fields **207** which may be included in a data storage structure. In alternate embodiments, alternate types of data storage structures and methods may be utilized.

Fields **207** include, but are not limited to, a local manufacturer identification (ID), products, scope of delivery, and contact information. In addition, although not depicted, a history of assembly and manufacture and ratings by users may also be stored according to local manufacturer ID.

With reference now to **Figure 10**, there is illustrated a block diagram of a data storage structure for remote manufacturer registration information in accordance with the method, system and program of the present invention. As illustrated, the data corresponding to remote manufacturer registration information is preferably stored in a data storage structure such as database table **210**. The example database table **210** is provided in order to depict a selection of fields **212** which may be included in a data storage structure. In alternate embodiments, alternate types of data storage structures and methods may be utilized.

Fields **212** include, but are not limited to, a remote manufacturer ID, product, attribute and contact information. In addition, although not depicted, a history of manufacture, user ratings and other historical information may be stored according to manufacturer. In addition, although not depicted, manufacturers may be further categorized according to variables offered for each attribute.

Referring now to **Figure 11**, there is depicted a block diagram of a data storage structure for user registration information in accordance with the method, system and program of the present invention. As illustrated, the data corresponding to user registration information is preferably stored in a data storage structure such as database table **220**. The example database table **220** is provided in order to depict a selection of fields **222** which may be included in a data storage structure. In alternate embodiments, alternate types of data storage structures

and method may be utilized.

Fields **222** include, but are not limited to, a user ID, personal information, financial information and shipping information. In addition, although not depicted, a history of personalized designs, purchases and ratings by manufacturers may be included.

With reference now to **Figure 12**, there is illustrated a block diagram of a data storage structure for tracking personalized designs in accordance with the method, system and program of the present invention. As depicted, the data corresponding to personalized design selections is preferably stored in a data storage structure such as database table **230**. The example database table **230** is provided in order to depict a selection of fields **232** which may be included in a data storage structure. In alternate embodiments, alternate types of data storage structures and methods may be utilized.

Fields **232** include, but are not limited to, a user ID, a design ID, a design name and the product being personalized. Preferably, further selections for each design are then references by design ID, as will be further described. In addition, the design name may be provided by the user or may be designated by the broker server.

Referring now to **Figure 13**, there is depicted a block diagram of a data storage structure for storing attribute and

variable selections for a personalized design in accordance with the method, system and program of the present invention. As illustrated, the data corresponding to attribute and variable selections is preferably stored in a data storage structure such as database table 240. The example database table 240 is provided in order to depict a selection of fields 242 which may be included in a data storage structure. In alternate embodiments, alternate types of data storage structures and methods may be utilized.

Fields **242** include, but are not limited to, a design ID, an attribute, and a variable selection. As previously described in **Figure 11**, a design ID references a user ID and product. Then, each attribute and variable selection is identified. In the present example, the variable selection for the figurine attribute is a "customizes graphic AA1" that is provided by the user for selection during design.

Preferably, the entries within database table 240 may further be utilized to determine the manufacturable parts of a design. For example, figurines may be one manufacturable part and cake pans that are a particular size and shape may be another manufacturable part.

25 With reference now to Figure 15, there is illustrated a block diagram of a data storage structure for storing local manufacturer bids in accordance with the method, system and program of the present invention. As depicted, the data

corresponding to local manufacturer bids is preferably stored in a data storage structure such as database table 250. The example database table 250 is provided in order to depict a selection of fields 252 which may be included in a data storage structure. In alternate embodiments, alternate types of data storage structures and methods may be utilized.

Fields 252 include, but are not limited to, a design ID, a local manufacturer ID, a bid for the personalized design and the selections needed from remote manufacturers. In particular, in indicating selections needed from remote manufacturers, a local manufacturer may provide additional specifications. For example, local manufacturer "L111" indicated that two triangle 30" cake pans are needed and more specifically, special coated cake pans.

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Referring now to Figure 16, there is depicted a block diagram of a data storage structure for storing remote manufacturer bids in accordance with the method, system and program of the present invention. As illustrated, the data corresponding to remote manufacturer bids is preferably stored in a data storage structure such as database table 260. The example database table 260 is provided in order to depict a selection of fields 262 which may be included in a data storage structure. In alternate embodiments, alternate types of data storage structures and methods may be utilized.

Fields 262 include, but are not limited to, a design ID, a remote manufacturer ID and a bid for a manufacturable part. The

broker server preferably utilizes both the local and remote manufacturer bids in compiling ordering options for a user and/or a local manufacturer.

5 While the invention has been particularly shown and described with reference to a preferred embodiment, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the invention.

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